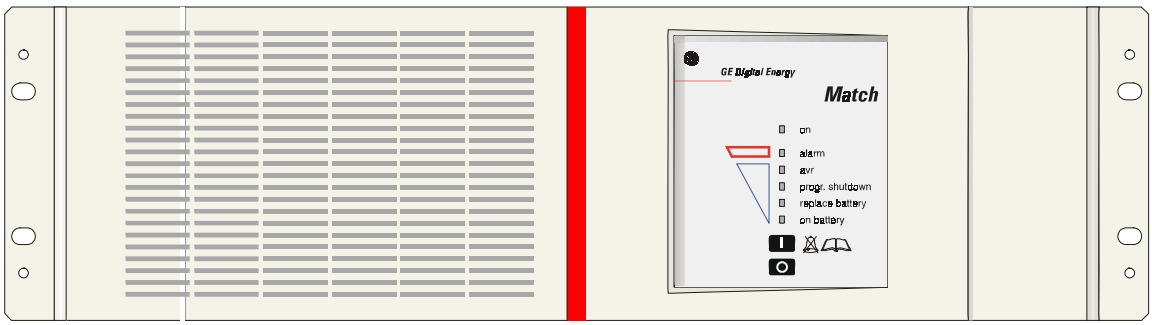
GE Digital Energy

Match 19"

Uninterruptible Power Supply
700 - 1500 VA



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CE

USER MANUAL

Match 19"

Uninterruptible Power Supply
700 - 1500 VA

Please read these instructions carefully before installation and start-up of the Match 19" UPS. Keep this manual in a safe place for future reference.

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1 - Introduction

1.1 Introduction

The ***General Electric (GE) Digital Energy Match 19" UPS***, an uninterruptible power supply, protects your equipment from all forms of power interference, including complete power failures.

1.2 Safety Rules

CAUTION: RISK OF ELECTRICAL SHOCK. The UPS contains batteries. The appliance outlets may be electrically live, even when the UPS is disconnected from the mains.
The UPS contains potentially hazardous voltages. Do not open the UPS, there are no user serviceable parts inside.
All maintenance and service work, *except for replacement of the batteries*, should be performed by qualified service personnel.

1.3 Transport / Storage

- No liability can be accepted for any transport damage when the equipment is shipped in non-original packaging.
- During transport the battery drawer must either be removed or fixed with two screws at the rear side of the UPS (A, fig. 1).
- Store the UPS in a dry location with the batteries in a fully charged state. Storage temperature must be within -20 +45 °C. If the unit is stored for a period exceeding 3 months, optimal battery lifetime is obtained if the storage temperature does not exceed 25°C.
- If the unit is stored for an extended period of time, the batteries must be recharged periodically. Be sure that the battery drawer is connected to the UPS. Subsequently connect the unit to a wall outlet and recharge the batteries for 24 hours:
  - if the storage temperature is within -20 and +30°C: every 3 months,
  - if the storage temperature is within -20 and +45°C: every month.

2 - Installation

The shipping box contains a Match 19" UPS, two IEC male-female power cords, a data cable, a CD ROM and this manual. After unpacking, inspect the UPS for damage. If you find any damage please immediately notify the carrier and place of purchase.

IMPORTANT:
Before making any connection and switching on the UPS, please check the following conditions:

- your mains supply is 220 - 240 Volts and 50 or 60 Hz, and
- the total power demand of the connected equipment does not exceed the rated output power of the UPS (indicated on the rating label).

2.1 Installation Rules

- The UPS is intended to be used in normal domestic and office situations.
- Protect the UPS, according to the wiring rules, with a 16A D-type fuse.
- The UPS must be powered from a single phase grounded wall outlet. Do not use extension cords.
- Avoid locations that are excessively humid, near water, near heat sources or in direct sunlight.
- The ambient temperature should not exceed 40°C. Optimal battery lifetime is obtained if the ambient temperature does not exceed 30°C.
- It is important that ventilation air can move freely around and through the unit. Do not block the air vents.
- Do not plug appliances such as electric heaters, toasters and vacuum cleaners into the UPS.
- Be careful when connecting laser printers: be sure that the demanded power does not exceed the capacity of the UPS.
- The sum of the leakage currents of the UPS and the connected loads should not exceed 3.5mA.

2.2 Installation Procedure

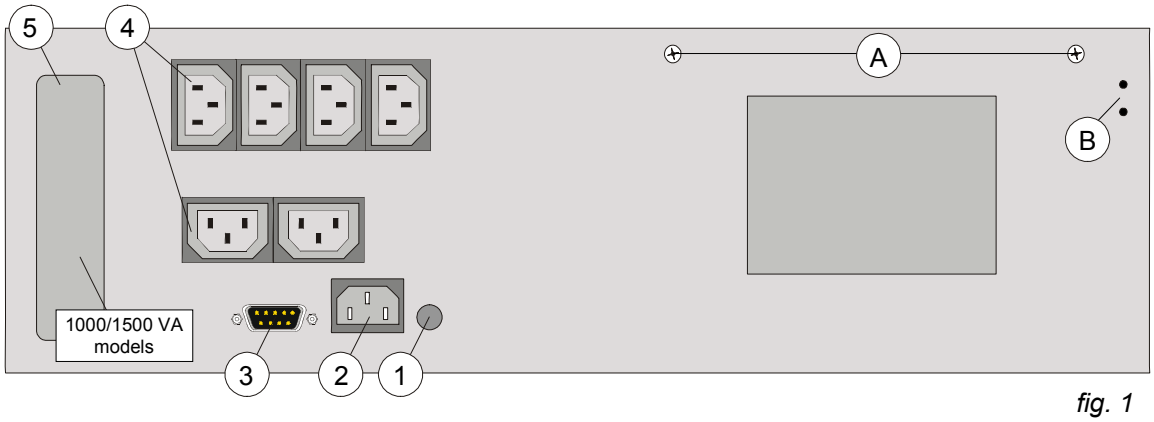


fig. 1

1. Remove the transport screws (A, fig. 1) and store them in the free holes (B, fig.1). Mount the Match 19" UPS in the 19" rack. The module must be supported by mounting rails, do not mount it by using the front brackets only. The front brackets allow mounting of handles (not included).

2. Make sure that the air vents in the side panels of the module are not blocked by the mounting rails or the side panels of the 19" rack.

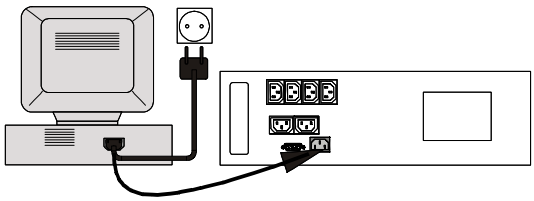


fig. 2

3. Switch off your computer, and unplug it from the socket-outlet.

4. Disconnect the power cord from the computer (rating 250Vac/10A) and connect this cord to the mains input socket (2, fig. 1) of the UPS. See fig. 2.

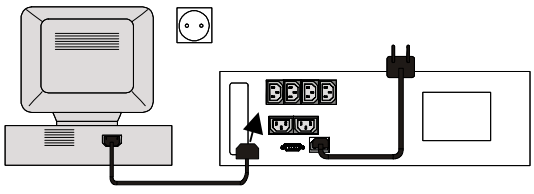


fig. 3

5. Using the output cord(s) provided, connect the computer(s) to the appliance outlet(s) (4, fig. 1) of the UPS. Spread the loads over the appliance outlets as equally as possible. If you use a distribution box to connect more than one appliance per outlet, please note that the maximum AC-current rating of each appliance outlet is 10Amps. See fig. 3.

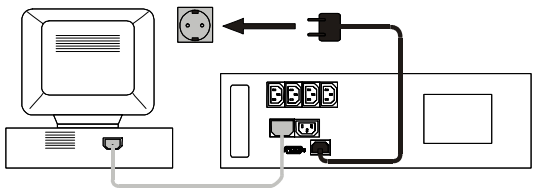


fig. 4

6. Connect the mains cord of the UPS to a working, grounded AC wall socket outlet. See fig. 4. The green LED 'on' (7, fig. 6) will blink: power is available and the batteries are charging. If the LED does not blink, press 'I' briefly. Probably LED 'replace battery' lights up; the LED goes out as soon as the batteries have been charged.

7. For best results, allow the UPS to recharge the batteries during a period of approx. 2 hours. It is acceptable to use the UPS without first charging the battery, but the runtime may be reduced.

8. For advanced communication possibilities, the RS232 interface port (3, fig. 1) can be connected to a computer system and/or optional interface cards (5, fig. 1, 1000/1500VA models only) can be added. See chapter 4.

3 - Operation

Please refer to figure 6.

3.1 Start-up

3.1.1 Start-up, mains available

1 Press keypad 'I' (13, fig. 6) briefly; LED ‘on’ (already blinking) will illuminate continuously now.
2 The equipment connected to the UPS can now be switched on.

3.1.2 Start-up, mains not available

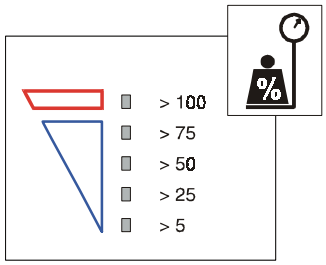
If the mains input is absent (power cord not connected, or mains failure):
1 Press keypad 'I' briefly, and then
2 Press keypad 'I' during 5 seconds until the buzzer sounds.
The LEDs 'on' and 'on battery' (12, fig. 6) will illuminate. The UPS operates on battery: it discharges the batteries.

3.2 Use: Normal Operation

3.2.1 Normal operation conditions:

- the mains supply is present,
- the UPS is on,
- the load does not exceed the capacity of the UPS and
- the operating temperature is below alarm level:

fig. 5



3.2.2 Load indication (fig. 5)

1 During normal operation, press keypad 'I' briefly.
2 Yellow LEDs will blink during 3 seconds, the number is load dependent (in case of overload LED 'alarm' (8, fig. 6) blinks as well).

3.2.3 Auto-off (no-load shutdown)

If this function is activated, the UPS will switch off during a mains failure when the load is less than 5% of the maximum load. In this way unnecessary discharging of the batteries is avoided. The unit will automatically turn on again when mains power is restored. The default setting of the no-load shutdown function is: activated. You can change this setting through the RS232 port, using the UPS configuration tool that came with the unit (CD ROM, see 5.4). Please note that if the UPS is not connected to the mains, and the batteries are disconnected from the UPS, the unit will return to the default setting.

3.2.4 Battery test

1 During normal operation, press keypad 'I' for one second.
2 The duration of the test is 4 seconds. See also 3.3.6.

3.2.5 Switching off

1 Press keypad ‘0’ (14, fig. 6) briefly.
2 If electric isolation is required, unplug the power cord from the wall outlet.

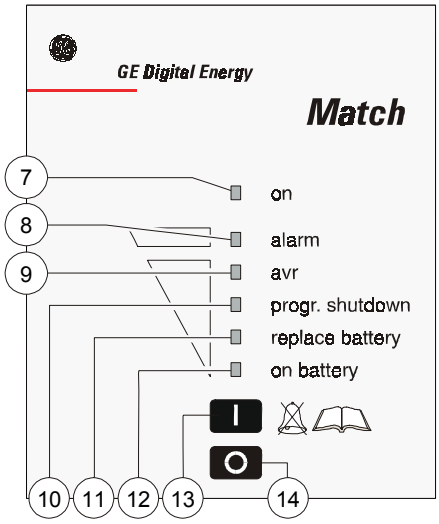
3.3 Use: Status and Alarm Indications

o status indications : the operating mode

! low priority alarms : abnormal operating situations

!! high priority alarms : situations in which *the actual output voltage of the UPS is no longer guaranteed*; immediate action should be taken

fig. 6



Situation		Indicators on front panel						
		on	alarm	avr	progr. shutd.	repl. batt.	on batt.	buzzer
o	**Charger on** (3.3.1)	- - - -						
o	**Normal operation** (3.3.2)	———						
o	**Automatic voltage regulation** (3.3.3)	———		- - - -				
!	**On battery** (3.3.4)	———					———	- - - -* 1x/8 s.
!!	**Battery low** (3.3.5)	———	- - - -				———	- - - -* 1x/s.
!	**Replace battery** (3.3.6)	———				———		
!!	**Overload** (3.3.7)	———	- - - -					———
!!	**High temperature** (3.3.8)	———	- - - -					- - - -* 1x/s.
o	**Progr. shutdown pending** (3.3.9)	———			- - - -			
o	**Progr. shutdown in progress** (3.3.9)	- - - -			———			

Operating modes and corresponding indications, see 3.3.1. – 3.3.9.

- - - - = intermitting
——— = continuous
* = resettable: press push button 'I' > 2 secs.

3.3.1 Charger on
The batteries are charging, see 2.2 step 6.

3.3.2 Normal operation
See 3.2.1.

3.3.3 AVR (Automatic Voltage Regulation) active
The quality of the incoming mains is poor, and the AVR boosts a low incoming voltage or reduces a high one (see chapter 7).

3.3.4 On battery
The UPS uses the energy stored in the batteries: see chapter 7 ‘Batteries - runtime’.
The UPS will shutdown
- after the batteries have been discharged (automatic restart), or
- if keypad 'O' is pressed (manual restart required) or
- if a 'UPS shutdown' command is given by the computer (manual restart required).
- if the load is < 5% and the auto-off function is activated (see 3.2.3)

Runtime indication (fig. 7)
During battery operation, press keypad 'I' briefly. The 4 yellow LEDs indicate during 3 seconds the remaining runtime time for the actual load.

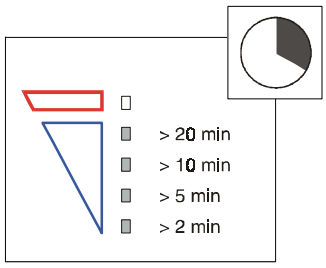


fig. 7

3.3.5 Battery low (end of runtime)
The batteries are nearly discharged. Controlled shutdown of your computer equipment should be completed within 1 minute.

3.3.6 Replace battery
The batteries are bad. The alarm only goes out after the next battery test: if the batteries have either been sufficiently charged (discharged batteries) or replaced by a new set (worn out batteries).

3.3.7 Overload
The demanded power of the equipment exceeds the UPS's rated output power. If overload persists during battery operation, the UPS may shut down.

3.3.8 High temperature
Overtemperature shut down during battery operation can occur from:
- extreme environmental temperature,
- lack of proper ventilation,
- overload situation.

When the pre-alarm sounds, check these conditions to avoid shutdown or damage. If the temperature rises further, the UPS will
- if it runs on mains: switch off the battery charger
- if it runs on battery: switch off completely. Output voltage is no longer available!

3.3.9 Programmed shutdown
The UPS monitoring software allows you to program a 'sleep period' of the UPS by sending two commands to the UPS:
- shut down after # minutes (blinking LED), and subsequently:
- shut down during # hours (continuous LED).

The programmed shutdown in progress can be cancelled:
- press keypad 'I' for at least 5 seconds to cancel shutdown and switch UPS on.
- press keypad '0' for at least 5 seconds to cancel shutdown and switch UPS off.

4 - Communication

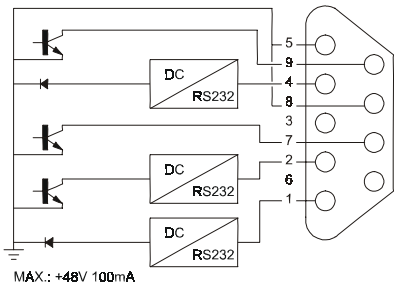
4.1 RS232 Port (fig. 8)

The RS 232 Port is a plug-in interface port (9-pin, Sub-D, male) which enables advanced communication between the UPS and the computer (interface kit required).

We strongly recommend to use only original ***GE Digital Energy*** software products in combination with the interface port.

Pin #	Function
1	RS232 input (UPS shutdown)
2	RS232 output
3	No function
4	Plug and Play
5	Common
6	No function
7	Battery low
8	UPS connected
9	Mains failure

fig. 8



4.2 Relay Interface Card (option, 1000/1500VA only)

The card is equipped with potential free change-over contacts for the following alarms:

- mains failure
- battery low

For more information please refer to the user manual that comes with the interface card.

4.3 SNMP Interface Card (option, 1000/1500VA only)

This card allows the data interface to be connected directly to an Ethernet network. When this card is installed the RS232 communication link is no longer available.
For more information please refer to the user manual that comes with the interface card.

5 - Maintenance

5.1 General

The UPS is virtually maintenance free: take care of proper environmental conditions and keep air inlets-outlets free of dust.
Please read 2.1.

5.2 Fuses

If the AC input fuse (1, fig. 1) is defect, be sure it is replaced by a compatible fuse from the same make and type:

FERRAZ TISP 5x20 or LITTLEFUSE 215 5x20 or WICKMANN 19181 5x20

Fuse ratings: see chapter 7.

5.3 Batteries

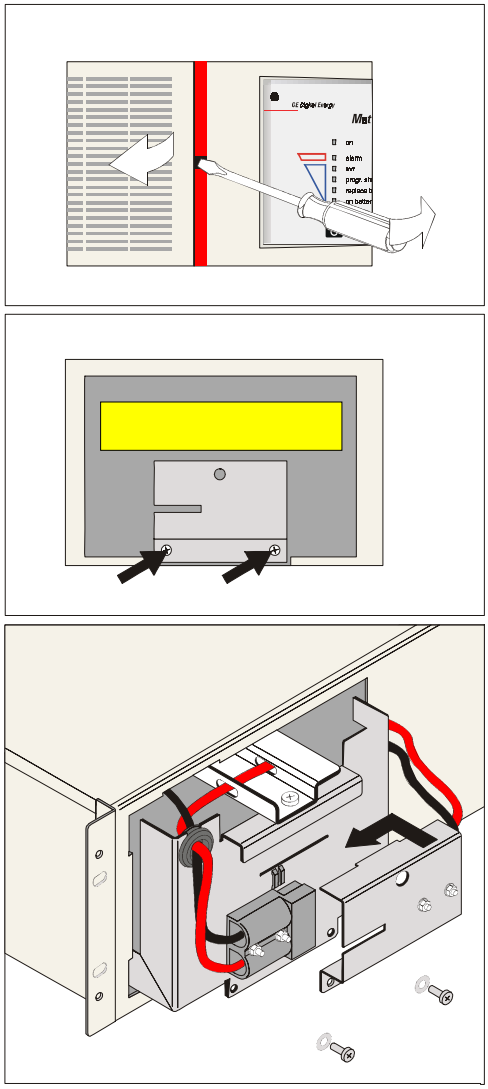
5.3.1 General

The service life of the battery is up to 6 years, depending on operating conditions.
As a healthy battery is critical to the performance of the UPS, keypad 'I' allows a Quick Battery Test (see 3.2.4). When the condition of the battery is critical, a *'replace battery'* alarm will be generated. Replace the batteries as soon as possible. See 5.3.2.

5.3.2 Battery replacement

- **WARNING:** first read the safety rules in section 1.2.
- When replacing the batteries, use the same number and voltage(V)/capacity(Ah).
- Proper disposal or recycling of the batteries is required. Refer to your local codes for disposal requirements.
- Never dispose of batteries in a fire: they may explode.
- Do not open or mutilate batteries: their contents (electrolyte) may be extremely toxic. If exposed to electrolyte, wash immediately with plenty of water.
- Avoid charging in a sealed container.
- Never short circuit batteries. When working with batteries, remove watches, rings or other metal objects, and only use insulated tools.

Battery replacement procedure



Refer to the label on the battery drawer.

1. Be sure that the transport screws (A, fig. 1) have been removed.
2. Remove the front panel of the battery compartment. Use a screw driver or pen as a lever.
3. Remove the two screws that hold the battery drawer.
4. Disconnect the DC connectors. Use a screwdriver as a lever.
5. Remove battery drawer. **Be careful, heavy weight!**
6. Remove clamp (two screws) and replace the batteries.
7. Reinstall battery clamp, do not pinch or clamp the wires.
8. Slide in the battery drawer.
9. Connect the DC connectors, a small spark is normal. Fasten the two screws.
10. Reinstall the front panel.

fig. 9

5.4 UPS Configuration Tool

With the UPS configuration software, that came with the unit on CD ROM, you are able to change the setting of the 'auto-off' function (3.2.3).

Insert the CD ROM in your computer, and
1. Select RUN from the start menu
2. Type a:\conftool (type for 'a' the appropriate drive letter)
3. Press ENTER

See also a:\README.TXT.

6 - Troubleshooting

Whenever a malfunction occurs, first check external factors (e.g connections, temperature, humidity or load) to determine whether the problem is caused by the unit itself or by its environment. Subsequently check the input fuse: it may be blown. If so: replace the fuse (see 5.2) and be sure that the UPS is not overloaded.
The following chart is a simple troubleshooting checklist only. If the suggested solution does not succeed, or if the information is insufficient to solve the problem, please contact your dealer or consult www.gedigitalenergy.com.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Connected equipment not operating properly, buzzer sounds continuously	Overload causes reduced output voltage	Reduce load
Blown input fuse	UPS overload	Reduce load, read 5.2, replace fuse
	System failure	Please contact your dealer or consult www.gedigitalenergy.com
UPS will not switch on to normal operation, LED 'on' remains off (charger off)	Line cord not connected	Read 2.2 'Installation' Connect line cord
	Dead socket-outlet, or mains voltage < approx. 187Vac, or mains frequency out of tolerance	Contact qualified electrician. Battery start is possible: see 3.1.2
	UPS overtemperature	Read 2.1 Allow UPS to cool down
	Blown input fuse	See above
UPS will not switch on to normal operation, LED 'on' blinks	Mains voltage between 165-187Vac	Contact qualified electrician
UPS will not switch to battery operation	Batteries depleted	Allow the UPS to recharge the batteries
	Battery drawers not connected	Read 5.3.2 Connect battery drawers
	System failure	Please contact your dealer or consult www.gedigitalenergy.com
UPS switched off automatically	Shut down by external (software) command during mains failure	Wait until mains returns
	UPS overtemperature	Read 2.1 Allow UPS to cool down
	Mains failure, battery discharged	Wait until mains returns
	Programmed shutdown in progress	See 3.3.9
	The load is < 5% of the max. load and no mains power is present. (No-load shutdown function is active, see 3.2.3)	Wait until mains returns
LED ‘replace battery’ illuminates, buzzer is silent	Quick Battery Test just after installation or mains failure	Allow the UPS to recharge the batteries
	Quick Battery Test shows weak battery	Read 5.3, replace the batteries

7 - Specifications

Match 19" model	:	**700**	**1000**	**1500**
Ratings				
Voltage Amperes (VA), with computer type load	:	700	1000	1500
Watts (W) with resistive load	:	420	600	900
Input				
AC input voltage	:	220 - 240 V		
AC input voltage window	:	165 - 275 V, mains operation		
Maximum AC input voltage	:	350V (above 275V battery operation)		
Minimum start-up AC voltage	:	187 V (at any load)		
Input frequency	:	50 Hz or 60 Hz		
Input frequency range	:	nominal ± 2.5 Hz		
No-load power consumption, normal operation	:	typically 7W (700) or 12W (1000/1500)		
AC input current (A)	:	4.0	6.0	8.0
AC input fuse (A)	:	5	10	10
Output				
AC output voltage	:	230 V (suitable for 220-240 V loads)		
AC output voltage tolerance	:	nominal ± 2% (battery operation, RMS value)		
Output frequency	:	50Hz or 60Hz (autosensing)		
Output frequency in case of battery start	:	last detected frequency (off factory 50 Hz)		
Output frequency stability	:	< ± 0.1Hz (battery operation)		
Output waveform	:	sine wave		
Power factor	:	0.6 (0.7 at 90% load)		
Transfer time	:	typical 4 ms.		
Buck/Boost voltage regulation	:	at 165-275 V input voltage: output voltage 190-254V		
Batteries (ratings given for 25°C)				
Nominal voltage (Vdc)	:	24	36	36
Number x capacity (Ah) of batteries	:	2x7	3x7	3x12
Type	:	12V, sealed lead acid, maintenance free		
Service life	:	up to 6 years (depending on use)		
Recharge current	:	3 A		
Battery recharge time for 90% capacity (hours, approximation)	:	2	2	2
Runtime in minutes at typical load (75%)	:	12	13	16
VA / Watts				
100/ 60		84	120	190
300/180		26	41	70
500/300		13	23	41
700/420		8	15	30
1000/600		-	8	20
1500/900		-	-	10
General				
Weight without battery drawers (kg)	:	14	15	15
Weight with battery drawers (kg)	:	19	22	26
Dimensions (hxwxd, mm)	:	133.5 (3HU) x 450 (19") x 440		
Depth required in 19" rack (mm)	:	420 (without connectors)		
Enclosure / protection	:	steel - plastic / IP20		
Environment				
Safety	:	EN 50091-1-1		
Electromagnetic compatibility	:	EN 50091-2		
Ambient temperature	:	-10 to +40°C;		
Sound at 1 meter	:	< 35 dB(A)		
Maximum relative humidity	:	95% (non-condensing)		